STATE OF TENNESSEE
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October 6, 2015

Honorable Tom Rowland
City of Cleveland
PO Box 1519
190 Church St. NE
Cleveland, TN 37377

Re: City of Cleveland Municipal Separate Storm Sewer System (MS4) – Phase II
NPDES Permit Number TNS075213
Bradley County, TN

Dear Mayor Rowland:

On September 30, 2015, Mr. Michael Bascom of the Division of Water Resources (DWR) completed a desk audit of the City of Cleveland's MS4 program. The audit focused specifically on the analytical monitoring requirements set forth in the NPDES MS4 Phase II permit. The purpose of the inspection was to independently determine City of Cleveland's compliance with the terms and conditions of its National Pollution Discharge Elimination System (NPDES) permit, NPDES Permit Tracking Number TNS075213.

Permit

The City of Cleveland has coverage under NPDES MS4 Phase II permit which became effective on April 19, 2011 with an expiration date of September 1, 2015. The permit requires the development of a storm water management program to improve water quality of receiving streams by controlling the quality and quantity of storm water runoff.

A review was conducted of all monitoring data that the City of Cleveland MS4 submitted to the Chattanooga Environmental Field Office. A summary of the data is below.

Analytical Monitoring [TNS000000, 5.1]

Requirement: Perform analytical monitoring in streams with EPA approved TMDLs and impaired streams. The Hiwassee watershed, HUC 06020002 has an EPA approved TMDL. The streams in Table 1 were evaluated because they are tributaries to Hiwassee watershed and because they are listed as being impaired for siltation, habitat alteration and pathogens.

Frequency: At least one sample per stream segment must be collected, with all segments in the MS4 jurisdiction sampled in a five-year period.

Table 1. Habitat Assessment of streams within the MS4 boundary that have an EPA TMDL or impaired.

EPA approved TMDL: Hiwassee watershed HUC 06020002

Waterbody	Sampling station	Date	SCORE	Habitat Assessment
Candies Creek	CANDI014.6BR (A1)	10/18/11	96	Impaired (<123)
	CANDI015.9BR (A2)	10/18/11	117	Impaired (<123)
	CANDI024.2BR (A3)	10/18/11	96	Impaired (<123)
Fillauer	FILLA000.3BR (B1)	10/21/11	88	Impaired (<123)
South Mouse Creek	SMOUS012.7BR (B2)	10/24/11	78	Impaired (<123)
	SMOUS014.2BR (B3)	10/24/11	97	Impaired (<123)
	SMOUS014.8BR (B4)	10/24/11	66	Impaired (<123)
	SMOUS014.9BR (B6)	11/11/11	96	Impaired (<123)
Woolen Mill Branch	WMILL000.8BR (B5)	10/24/11	54	Impaired (<123)
Little Chatata Creek	LCHAT004.3BR (C1)	10/18/11	104	Impaired (<123)

Source: 2011 TMDL Siltation/Habitat alteration and Benthic Monitoring report, dated March 7, 2012 collected by S& ME, Inc.
All of the watersheds are within Ecoregion 67G except for Little Chatata which is in 67F.

According to 2011 TMDL Siltation/Habitat alteration and Benthic Monitoring report, dated March 7, 2012, biological stream surveys were conducted according to the Semi-Quantitative Single Habitat (SQSH) Method as identified in the division's *Quality System Standard Operating Procedure for Macroinvertebrate Stream Survey*, revised July 1, 2011.

Analytical Monitoring for Macroinvertebrate sampling [TNS000000, 5.1]

Table 2. Field Parameters and Flow measurements **Watershed: Hiwassee**						
Sampling station	**DATE**	**Temp (°C)**	**DO ($mg \cdot l^{-1}$)**	**pH**	**Conductivity**	**Flow (cfs)**
CANDI014.6BR (A1)	10/18/11	15.9	6.9	8.0	292	37.3
CANDI015.9BR (A2)	10/18/11	16.2	7.3	8.0	298	36.6
CANDI024.2BR (A3)	10/18/11	16.9	7.1	8.1	299	15.6
FILLA000.3BR (B1)	10/21/11	15.0	8.0	8.3	385	9.1
SMOUS012.7BR (B2)	10/24/11	14.0	7.9	8.4	398	9.0
SMOUS014.2BR (B3)	10/24/11	14.9	8.1	8.4	425	10.1
SMOUS014.8BR (B4)	10/24/11	15.1	8.0	8.4	395	10.0
SMOUS014.9BR (B6)	11/11/11	17.1	7.9	8.2	365	2.5
WMILL000.8BR (B5)	10/24/11	10.8	9.1	7.9	387	1.9
LCHAT004.3BR (C1)	10/18/11	18.3	6.9	7.9	343	1.8
Source: 2011 TMDL Siltation/Habitat alteration and Benthic Monitoring report, dated March 7, 2012 collected by S& ME, Inc. Approved EPA TMDL: Hiwassee watershed HUC 06020002						

Field parameters and flow measurements were recorded at each biological monitoring station before the site was sampled as required by the division's *Quality System Standard Operating Procedure for Macroinvertebrate Stream Survey*, revised July 1, 2011.

Table 3. Hiwassee Watershed TMI values								
	Candies Creek						Little Chatata	
	CANDI014.6BR (A1)		CANDI015.9BR (A2)		CANDI024.2BR (A3)		LCHAT004.3BR (C1)	
METRIC	VALUE	SCORE	VALUE	SCORE	VALUE	SCORE	VALUE	SCORE
TOTAL NO.	222	N/A	184	N/A	232	N/A	186	N/A
TR	32	6	30	6	37	6	29	6
EPT RICHNESS	7	4	8	4	8	4	9	4
% EPT	25.23	2	45.65	6	22.00	2	25.27	2
% OC	34.68	4	26.09	6	18.10	6	57.53	2
NCBI	5.30	4	4.76	6	4.83	6	5.11	4
%TNUTOL	54.50	2	39.67	4	39.66	4	36.56	4
% CLINGERS	37.39	4	67.39	6	25.86	2	43.01	4
TMI SCORE	26		38		30		26	
Source: Table 4A, 2011 TMDL Siltation/Habitat alteration and Benthic Monitoring report, dated March 7, 2012 collected by S& ME, Inc.								

Table 4. Hiwassee Watershed TMI Values								
	Fillauer Creek		South Mouse Creek					
	FILLA000.3BR		SMOUS012.7BR		SMOUS014.2BR		SMOUS014.8BR	
METRIC	VALUE	SCORE	VALUE	SCORE	VALUE	SCORE	VALUE	SCORE
TOTAL NO.	224	N/A	221	N/A	210	N/A	228	N/A
TR	34	6	27	4	23	4	21	4
EPT RICHNESS	3	0	3	0	4	2	2	0
% EPT	15.63	2	4.52	0	2.86	0	1.32	0
% OC	24.11	6	47.51	4	71.43	2	28.51	4
NCBI	5.15	4	5.89	4	6.18	4	4.85	6
%TNUTOL	26.34	6	34.39	4	39.52	4	14.04	6
% CLINGERS	20.09	2	61.99	6	57.14	6	74.56	6
TMI SCORE	26		22		22		26	
Source: Table 4B, 2011 TMDL Siltation/Habitat alteration and Benthic Monitoring report, dated March 7, 2012 collected by S& ME, Inc.								

Table 5. Hiwassee Watershed TMI Values				
	South Mouse		Woolen Mill	
	SMOUS014.9BR (B6)		WMILL000.8BR (B5)	
METRIC	VALUE	SCORE	VALUE	SCORE
TOTAL NO.	194	N/A	169	N/A
TR	29	6	21	4
EPT RICHNESS	2	0	3	0
% EPT	5.67	0	3.55	0
% OC	51.55	2	87.57	0
NCBI	5.84	4	5.84	4
%TNUTOL	44.85	4	60.36	2
% CLINGERS	55.15	6	68.64	6
TMI SCORE	**22**		**16**	
Source: Table 4B, 2011 TMDL Siltation/Habitat alteration and Benthic Monitoring report, dated March 7, 2012 collected by S& ME, Inc.				

"According to the biometric analysis, the ten locations scored between 16 and 38 on the TMI. According to TMI scores, only one of the sampling locations scored at or above the Target TMI of 32. The Candies Creek location (CANDI015.9BR (A2)) is located just west of the intersection of Georgetown Pike and Villa Drive and scored a healthy TMI of 38. The average TMI score for candies Creek watershed is 31.1. The average for the Chatata Creek watershed was 26, and the average for South Mouse Creek watershed was 22.3. The Candies Creek watershed scored closest to the target TMI of 32, with South Mouse Creek scoring the farthest from the target TMI. This watershed is also the most directly influenced by urbanization because it flows through the most developed area of the City of Cleveland" (2011 TMDL Siltation/Habitat alteration and Benthic Monitoring report, March 7, 2012).

Analytical Monitoring for Pathogens [TNS000000, 5.1]

Requirement: Bacteriological sampling is required for all stream segments identified as being impaired for pathogens, where discharges from the MS4 have been identified as a source of the impairment. Sampling included five stream samples within a thirty-day period (to establish a geometric mean), and be performed according to the division's Quality System Standard Operating Procedure.

Frequency: Bacteriological sampling must be performed such that all pathogen-impaired segments in the MS4 jurisdiction are sampled within a five-year period.

Table 6. Summary of Bacteriological Sampling in streams listed as impaired for Pathogens.			
Escherichia coli at Candies Creek			
	Date	E. coli	Sample Station
CANDIES1309101	9/4/2013	300	CANDI024.1BR
CANDIES1309102	9/9/2013	590	CANDI024.1BR
CANDIES1309103	9/11/2013	188	CANDI024.1BR
CANDIES1309104	9/16/2013	230	CANDI024.1BR
CANDIES1309105	9/18/2013	510	CANDI024.1BR
Escherichia coli at South Mouse Creek			
	Date	E. coli	Sample Station
SMOUSE1309101	9/4/2013	270	SMOUS008.8BR
SMOUSE1309102	9/9/2013	8600	SMOUS008.8BR
SMOUSE1309103	9/11/2013	8	SMOUS008.8BR
SMOUSE1309104	9/16/2013	42	SMOUS008.8BR
SMOUSE1309105	9/18/2013	200	SMOUS008.8BR
Escherichia coli at South Mouse Creek			
	Date	E. coli	Sample Station
SMOUSE1309201	9/4/2013	310	SMOUS011.5BR
SMOUSE1309202	9/9/2013	450	SMOUS011.5BR
SMOUSE1309203	9/11/2013	357	SMOUS011.5BR
SMOUSE1309204	9/16/2013	350	SMOUS011.5BR
SMOUSE1309205	9/18/2013	300	SMOUS011.5BR
Escherichia coli at South Mouse Creek			
	Date	E. coli	Sample Station
SMOUSE1309301	9/4/2013	128	SMOUS016.2BR
SMOUSE1309302	9/9/2013	200	SMOUS016.2BR
SMOUSE1309303	9/11/2013	41	SMOUS016.2BR
SMOUSE1309304	9/16/2013	136	SMOUS016.2BR
SMOUSE1309305	9/18/2013	380	SMOUS016.2BR
Escherichia coli at Fillauer			
	Date	E. coli	Sample Station
FILLAUER1309101	9/4/2013	860	FILLA001.2BR
FILLAUER1309102	9/9/2013	1260	FILLA001.2BR
FILLAUER1309103	9/11/2013	45	FILLA001.2BR
FILLAUER1309104	9/16/2013	94	FILLA001.2BR
FILLAUER1309105	9/18/2013	790	FILLA001.2BR

Escherichia coli at Fillauer			
	Date	E. coli	Sample Station
FILLAUER1309201	9/4/2013	500	FILLA1.1T0.3BR
FILLAUER1309202	9/9/2013	94	FILLA1.1T0.3BR
FILLAUER1309203	9/11/2013	184	FILLA1.1T0.3BR
FILLAUER1309204	9/16/2013	270	FILLA1.1T0.3BR
FILLAUER1309205	9/18/2013	142	FILLA1.1T0.3BR
Escherichia coli at Fillauer			
	Date	E. coli	Sample Station
FILLAUER1309301	9/4/2013	270	FILLA1.1T0.1T0.1BR
FILLAUER1309302	9/9/2013	360	FILLA1.1T0.1T0.1BR
FILLAUER1309303	9/11/2013	91	FILLA1.1T0.1T0.1BR
FILLAUER1309304	9/16/2013	360	FILLA1.1T0.1T0.1BR
FILLAUER1309305	9/18/2013	70	FILLA1.1T0.1T0.1BR
Escherichia coli at Woolen Mill			
	Date	E. coli	Sample Station
WOOLENMILL1309101	9/4/2013	320	WMILL000.8BR
WOOLENMILL1309102	9/9/2013	470	WMILL000.8BR
WOOLENMILL1309103	9/11/2013	41	WMILL000.8BR
WOOLENMILL1309104	9/16/2013	180	WMILL000.8BR
WOOLENMILL1309105	9/18/2013	170	WMILL000.8BR
Escherichia coli at Little Chatata			
	Date	E. coli	Sample Station
LCHATATA1309101	9/4/2013	36	LCHAT004.0BR
LCHATATA1309102	9/9/2013	48	LCHAT004.0BR
LCHATATA1309103	9/11/2013	129	LCHAT004.0BR
LCHATATA1309104	9/16/2013	33	LCHAT004.0BR
LCHATATA1309105	9/18/2013	44	LCHAT004.0BR
Units: MPN/100ml			
Source: City of Cleveland MS4 excel spreadsheet			

According to the report, bacteriological stream sampling was performed utilizing methods identified in the division's *Quality System Standard Operating Procedure for Chemical and Bacteriological Sampling of Surface Water*, revised December 2009.

Non-analytical Monitoring [TNS000000, 5.2]

Visual Stream Surveys and Impairment Inventories are included in the 2011 TMDL Siltation/Habitat alteration and Benthic Monitoring report, dated March 7, 2012 submitted to TDEC DWR.

According to our review, all of the monitoring required by your NPDES permit has been conducted and all the required deliverables have been submitted to TDEC DWR.

Required Actions:

Prior to December 31, 2015, City of Cleveland MS4 must submit to DWR a GIS shape file that delineates the MS4's boundary. Please be sure to submit a new shape file whenever MS4 boundary changes occur.

Recommended Actions:

DWR recommends that the City of Cleveland MS4 integrate its pathogen monitoring with its Illicit Discharge Detection and Elimination program. In the future, if monitoring data indicates above normal E.coli levels, the MS4 should take immediate action to identify and eliminate the source of the E. coli.

Additional Comments:

After you receive your new permit, please arrange a time to meet with Charles Walton, Biologist to discuss what monitoring is required. We believe it is advantageous for the City to meet with DWR in order to ensure that monitoring will be conducted appropriately and avoid possible issues.

This letter provides a record of the September 30, 2015 TDEC DWR Desk Audit of City of Cleveland MS4's Analytical and Non-Analytical Monitoring.

We thank the City of Cleveland for its efforts toward compliance with its NPDES permit. Furthermore, you have taken a proactive approach for protecting the streams and waterways of Tennessee. If you have any questions concerning either our inspection or this report, please contact Mr. Bascom at (423) 634-5710.

Sincerely,

Jennifer Innes
Program Manager
Division of Water Resources

cc: Chris Broom, Stormwater Coordinator, City of Cleveland via email